Journal of Analytical Chemistry 2013 vol.68 N6, pages 516-524

Voltammetry determination of dopamine by the electrocatalytic response of an electrode modified by a polyaniline film with an inclusion of copper(II) tetrasulfophthalocyanine

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Abstract

A polyaniline composite film with an inclusion of copper(II) tetrasulfophthalocyanine, applied on a glassy-carbon electrode (GC) has demonstrated a mediatory activity in the oxidation of dopamine in acidic and neutral media. The conditions for the formation of a polymer film on the surface of a glassy-carbon electrode for registering the maximum electrocatalytic effect in the oxidation of dopamine are found. A method of voltammetric and amperometric detection of dopamine on the composite film electrode under static and flow conditions is proposed. The use of a polyaniline composite with an inclusion of copper(II) tetrasulfophthalocyanine, coated with a Nafion film, made possible the reduction of the detection limit for dopamine to 1 × 10-8 M under static conditions and to 5.0 nmol under the conditions of flow-injection analysis. © 2013 Pleiades Publishing, Ltd.

http://dx.doi.org/10.1134/S1061934813060129

Keywords

chemically modified electrodes, copper(II) phthalocyanine, electrocatalysis, electrooxidation of dopamine, flow-injection analysis, polyaniline